

## Out-of-hours primary care end of life prescribing

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## Out-of-hours primary care prescribing at the end of life – a data linkage study in Oxfordshire.

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# Abstract

## Objectives

Out-of-hours (OOH) primary care services are contacted in the last four weeks of life by nearly 30% of all patients who die, but OOH palliative prescribing remains poorly understood. Our understanding of prescribing demand has previously been limited by difficulties identifying palliative patients seen OOH. This study examines the volume and type of prescriptions issued by OOH services at the end of life.

## Methods

A retrospective cohort study was performed by linking a database of Oxfordshire OOH service contacts over a year with national mortality data, identifying patients who died within 30 days of OOH contact. Demographic, service, and prescribing data were analysed.

## Results

A prescription is issued at 14.2% of contacts in the 30 days prior to death, compared with 29.9% of other contacts. The most common prescriptions were antibiotics (22.2%) and strong opioids (19%). 41.8% of prescriptions are for subcutaneously administered medication. Patients who were prescribed a syringe driver medication made twice as many OOH contacts in the 30 days prior to death compared with those who were not.

## Conclusion

Absolute and relative prescribing rates are low in the 30 days prior to death. Further research is required to understand what occurs at these non-prescribing end of life contacts to inform how OOH provision can best meet the needs of dying patients. Overall, relatively few patients are prescribed strong opioids or syringe drivers. When a syringe driver medication is prescribed this may help identify patients likely to be in need of further support from the service.

## Aim

Primary care plays a significant role at the end of life, with most patients spending the majority of their last year of life in the community and preferring to die at home (1,2). Out-of-hours (OOH) GP services are involved in end of life care for approximately 30% of patients (3). Provision of palliative care outside of working hours is a research priority, however, the role of OOH services prescribing palliative medications remains poorly understood (4,5). This is partly due to difficulties identifying palliative care contacts from OOH records, where using clinical codes significantly underestimates the patient demand (3). Understanding the demand for end of life prescribing has important implications for OOH service design and delivery to improve care. This short report describes end of life prescribing practice within an English OOH service using a unique linked dataset which allowed us to identify all patients who had contact with the service within 30 days of death. We aimed to explore the volume and type of prescriptions issued at the end of life. We also aimed to explore the role of the OOH in prescribing syringe driver medications.

## Methods

A database of all patient contacts with the Oxfordshire OOH service over 1 year (1 December 2014-30 November 2015) was created from the OOH Electronic Record System (Adastra™). This was linked with Oxfordshire mortality data from NHS Digital via NHS number to identify people who had died within 30 days of contact with the OOH service. Full details of the OOH service and database creation are described elsewhere (3).

Patients who had contact with the OOH service in the 30 days prior to death were categorised into those who had been documented as palliative by the service and those who had not. We defined palliative patients as those who had been assigned a clinical code specific to palliative care, been referred to a hospice or been prescribed an appropriate subcutaneous medication by the OOH service, as described fully elsewhere (3). Demographical details were compared for patients rather than contacts, so that each patient was only considered once in the analysis. Service data were compared at an OOH contact level. Statistical analysis was performed using SPSS V.22.

## Results

102,876 contacts with the Oxfordshire OOH service were made with 67,942 individual patients over the 12 month study period, of whom 1530 (2.25%) died within 30 days of an OOH contact, representing 2.59% of all contacts to the service.

### Prescriptions issued at the end of life

85.8% of contacts with patients in the 30 days prior to death did not result in a prescription being issued, compared with 70.1% of contacts with patients who survived beyond 30 days (15.7% difference, 95% CI 13.9%-17.4%). This difference persisted when home visits were excluded from the analysis, where drugs might have been issued directly from the OOH car rather than by prescription for subsequent dispensing at a community pharmacy (81.8% vs 67.9%, i.e. 13.9% difference, 95% CI 11.2%-16.5%).

319 patients received prescriptions from the OOH service in the 30 days prior to death. 68.3% of these patients received only one prescription during this time. Morphine was most commonly prescribed drug overall (13.4% of prescriptions issued), followed by midazolam (10.4%) and amoxicillin (7.1%). When grouped according to type, antibiotics were most commonly prescribed (22.2%), then strong opioids (19%) and anti-emetics (12.1%) (See Table 1.) Medications were most commonly prescribed for oral administration (44.3%), with most of the remainder subcutaneous

(41.8%). The majority (64.8%) of strong opioids were prescribed subcutaneously, mostly via a syringe driver (71.4%).

The most commonly prescribed antibiotics were amoxicillin (30.9%), trimethoprim (25.4%) and co-amoxiclav (17.4%). Where a relevant clinical code was assigned to the contact, 39.7% of antibiotic prescriptions were for urinary tract infections, 31.7% for respiratory conditions and 2.4% for skin infections, with no relevant clinical code in 25.4% of cases.

The majority (74.5%) of prescribed analgesia was strong opioids, 14.5% simple analgesia and 11.0% weak opioids (see Table 1 for classifications). Of the strong opioids prescribed, 38.9% were subcutaneous via a syringe driver, 25.9% oral, 24.1% a subcutaneous bolus, 8.3% transdermal, 1.9% intramuscular injection and 0.9% intravenous injection.

48.3% of all prescriptions were issued at home visits. When only considering home visits, midazolam, morphine, and amoxicillin remained the three most commonly prescribed drugs, but subcutaneous medications were prescribed more commonly than oral (48.0% vs 38.7%). 96.5% of prescribing contacts, and 97.6% of contacts where antibiotics were prescribed, were with patients where ongoing community management was planned.

### Comparison between patients documented as palliative and patients not documented as palliative.

Patients who had contact with the OOH service in the 30 days prior to death were further categorised by whether they had been documented as palliative by the service. 53.4% of patients documented as palliative had a cancer diagnosis listed as their ICD-10 primary cause of death, compared to 24.0% of patients who were not documented as palliative. Further details of the differences between these groups are documented elsewhere (6).

Patients who were documented as palliative were more likely to receive a prescription, with of patients documented as palliative receiving a prescription at 16.3% of contacts compared with 12.1% of contacts for those who were not documented as palliative (4.20% difference, 95% CI 1.54%-6.85%).

The most commonly prescribed medications also differed according to whether the patient was documented palliative or not. For patients documented palliative, the three most commonly prescribed medications were morphine, midazolam and hyoscine butylbromide compared with amoxicillin, trimethoprim and co-amoxiclav for contacts not documented palliative. The overall pattern of prescribing mirrored this difference (see Table 1).

Table1 – Medication types prescribed at contacts within the 30 days prior to death

Type of medication	All contacts within 30 days of death (n=2661)			Contacts documented as palliative (n= 1310)			Contacts not documented as palliative (n=1351)		
	Number	% of scripts	Rank	Number	% of scripts	Rank	Number	% of scripts	Rank
Antibiotic	125	22.2%	1	31	8.7%	5	94	45.6%	1
Strong opioid*	107	19.0%	2	90	25.2%	1	17	8.3%	2
Antiemetic	68	12.1%	3	56	15.7%	3	12	5.8%	5
Sedative	58	10.3%	4	57	16.0%	2	1	0.5%	19=
Antispasmodic	37	6.6%	5	36	10.1%	4	1	0.5%	19=
Water for injection	21	3.7%	6	21	5.9%	6	0	0.0%	n/a
Simple analgesia**	18	3.2%	7	9	2.5%	8	9	4.4%	6

Laxative	16	2.8%	8	4	1.1%	11	12	5.8%	4
Weak opioid***	16	2.8%	9	3	0.8%	13	13	6.3%	3
Antipsychotic	15	2.7%	10	15	4.2%	6	0	0.0%	n/a
Benzodiazepine	13	2.3%	11	9	2.5%	9	4	1.9%	9=
Antifungal	8	1.4%	12	3	0.8%	14	5	2.4%	7=

\* Strong opioids were morphine, diamorphine, oxycodone, fentanyl and buprenorphine

\*\*Simple analgesia was paracetamol, ibuprofen and naproxen

\*\*\*Weak opioids were codeine, codydramol and tramadol.

### Syringe driver medications

4.5% of patients who contacted the OOH service in the 30 days prior to death were prescribed medications for a syringe driver, either at home visits (43.2%) or by telephone (56.8%). Those patients who were prescribed syringe driver medications made a median of 3 contacts (IQR 2 - 5) in the 30 days prior to death vs 1 contact (IQR 1-2) for those who were not prescribed syringe driver medications (test for difference in median contacts, Mann Whitney U 23569.5,  $p < 0.0001$ .)

## Discussion

Few prescriptions are issued by the GP OOH service near the end of life. From a study population of 67,943, of whom 1530 died within 30 days, only 319 received a prescription in the 30 days prior to death. Further research is required to understand the needs of patients in these non-prescribing end of life contacts. This suggests that the OOH GP role extends beyond pharmacological intervention, perhaps meeting an unmet need for reassurance, information or advice, or coordinating with other professionals involved in the patients care (7,8). Both OOH users and providers recognise that the current generic acute OOH service does not necessarily take account of these complex and different needs (7). Time pressure constraints in OOH services are also a recognised problem (9). Low absolute and relative prescribing rates in this group might suggest that there may be a role for non-prescribing allied health professionals, with prescribing support as required, in any service designed to target end of life care in the OOH primary care setting.

This is the first study to accurately report OOH prescribing practice prior to death by linking UK OOH records with mortality data. Previous research examining the role of the OOH GP in palliative care has focused on cancer patients or relied on clinical coding of 'palliative care' as a proxy for end of life (10,11). This ignores non-cancer palliative patients and the significant proportion of patients requiring end of life care despite non-palliative clinical codes being assigned, for example, symptom codes. The inclusion of non-cancer decedents, who are less likely to receive adequate community pain control, may explain lower prescribing rates in this study (10,12). Patients documented as palliative by the service were more likely to receive a prescription than those who were not, and this was three times more likely to be a strong opioid.

For those patients who do receive a prescription from the OOH GP service, antibiotics are the most common prescription. Whilst this may represent appropriate treatment of a suspected and presumed treatable bacterial infection, antimicrobials have been shown to be commonly prescribed to dying patients in the absence of adequate clinical symptoms indicating bacterial infection (13). Improving palliative care requires reassessment of the best of use of antimicrobials in the final weeks of life(14), and this consideration appears to also apply to OOH primary care .

Strong opioids are only prescribed at 4.0% of contacts occurring with the 30 days prior to death and syringe driver medications are prescribed at <5%. However, patients prescribed a syringe driver medication made twice as many OOH contacts in the 30 days prior to death. Given the importance of a proactive approach to end of life, and continuity of care, the prescription of any syringe driver medication by the OOH service may represent an opportunity to flag up these patients for further in hours review by their own GP or a more joined up working approach between in hours and OOH clinicians (15,16).

## Conclusion

Prescribing rates are low in the 30 days prior to death. Further research is required to understand what occurs at these non-prescribing end of life contacts to inform how OOH provision can best meet the needs of dying patients and their carers.

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## Competing Interest

Competing Interest: None declared.

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